



**IKA**<sup>®</sup>

## Standard Production Plant SPP



**designed**  
to work perfectly

## Executed in IKA® quality

IKA® has developed the „Standard Production Plant – SPP“, a highly versatile system, ideal for optimum, cost-efficient manufacturing of a broad spectrum of products.



### Proven and precise technology at its best

The approved “Standard Production Plant” SPP is the IKA® solution for the processing of emulsions and suspensions in many fields of application. It is available in 8 sizes ranging from 25 to 4,000 liters capacity.

The SPP is an innovative and highly advanced, yet cost-efficient mixing plant used for all standard process operations such as mixing, stirring, homogenizing and dispersing. Due to its simple design it allows easy operation and lowest space requirements especially in height. Advanced mixing equipment guarantees a constant product quality. Options like vacuum degassing, double jacket for heating or cooling and ports for the additive incorporation and sampling make the SPP an ideal machine for the complete product manufacturing sequence.

Flexible and easy to customize to the specific application, the SPP can be used e. g. for cosmetic creams and lotions in the cosmetic and pharma industry, for mayonnaise or dressings in the food industry, for suspensions and emulsions in the chemical industry as well as for production of paints and lacquers.



DIN EN ISO 9001



For more information please visit  
[www.ikaprocess.com](http://www.ikaprocess.com)

# SPP | Components

**IKA®+**

The IKA® Standard Production Plant is a **highly modern but cost-efficient mixing plant** for all basic operations requiring mixing and dispersing technology.

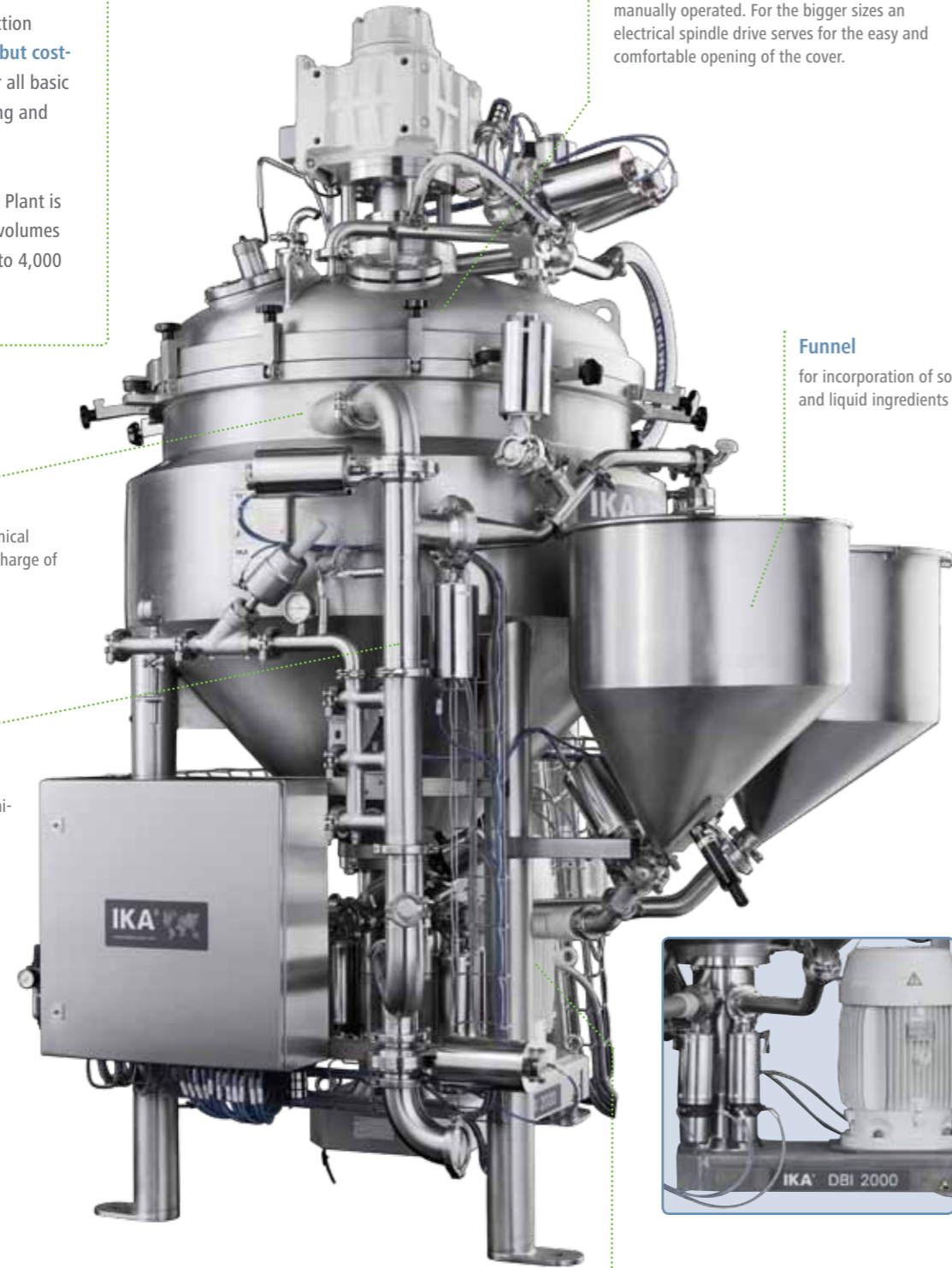
IKA® Standard Production Plant is **available in 8 sizes** with volumes ranging from 25 litres up to 4,000 litres.

## Mixing vessel

The unique shape with the conical bottom ensures complete discharge of the final product.

## Circulation Loop

Big dimensioned pipeline with 2-way butterfly valves and sanitary clamp connections



## Vessel cover

The Standard Production Plant is available with tilting devices for the vessel cover. The smaller plant sizes up to SPP 250 are manually operated. For the bigger sizes an electrical spindle drive serves for the easy and comfortable opening of the cover.

## Funnel

for incorporation of solid and liquid ingredients



## Dispersing machine

High capacity dispersing machine guarantees high-quality and stable emulsions and suspensions.



## Perfection in detail: Mixing plant in an economical and flexible design

### Inspection

Two sight glasses in the vessel cover and a light make it possible to illuminate the vessel and observe the process inside.



### CIP-cleaning

Three spray nozzles in the vessel lid ensure a thorough cleaning without dead spots or shadow areas. Sufficient pressure and outstanding throughput to feed the spray nozzles is supplied by the dispersing machine DBI. There is no need for an additional CIP-pump.

### Compact Design

Due to its unique vessel geometry the IKA® Standard Production Plant is distinguished by its extremely low constructional height. Additionally, the unit is very compact and suitable for sites with limited space availability. As an option the vessel cover can be opened by means of a simple and oil free tilting device, thus enabling easy access to the vessel inner parts for all maintenance work or visual checks with a minimum space requirement.



### Scrapers

The highly advanced design keeps the vessel inner surface free from scaling and ensures the best heat transfer between product and double jacket.



### Agitator design

The Standard Production Plant is equipped with an anchor stirrer and flow breaker that can be used with a frequency converter, which is optionally available. The special design offers significant advantages for the handling of different viscosities. It is suitable for viscosities up to approximately 100,000 mPas.

## Pumping, Suction, Mixing, Dispersing, Cleaning

### Direct Batch Inline

The DBI 2000 is the heart of the Standard Production Plant. Its innovative technical design enables better process data and reduced processing times at optimum dispersing quality in a wide viscosity range.

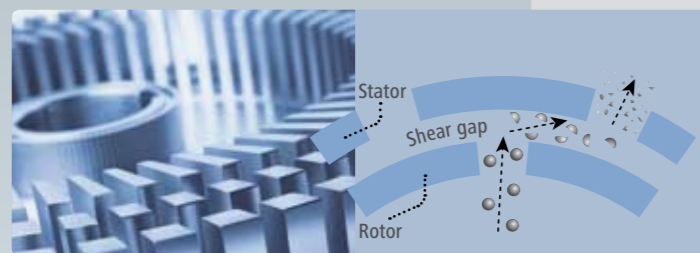
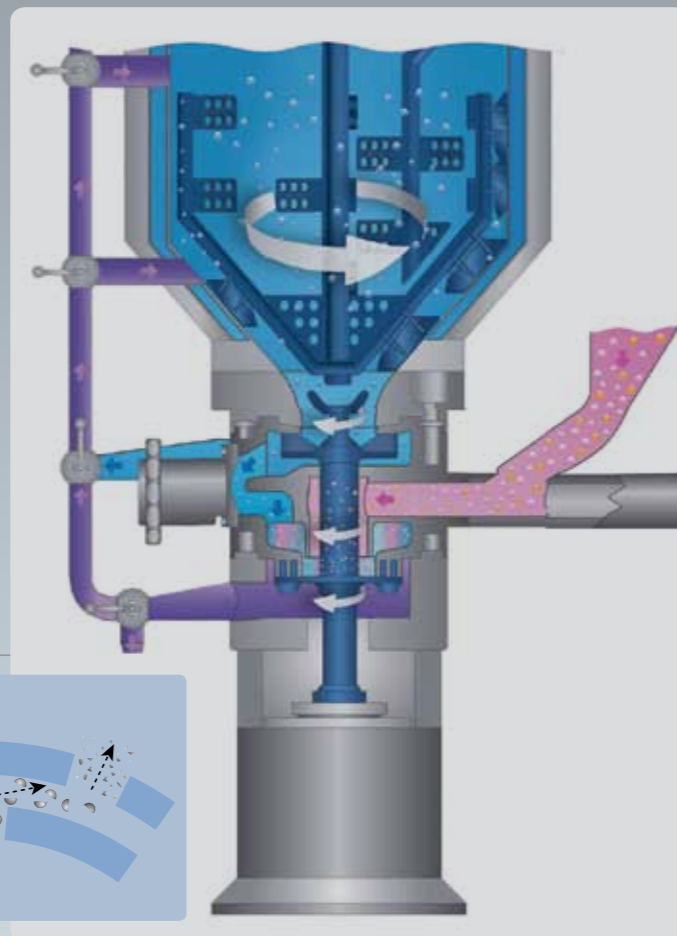
The high shear mixing and dispersing machine DBI 2000 is designed for the batch operation with a recirculating loop. It is directly flange connected to the vessel outlet with a big cross section and pumps the product back into the vessel. The DBI 2000 enables suction, pumping, dispersing and self-cleaning under CIP conditions. The machine has a patented

two-stage design. Depending on the process requirement the operator can select whether to use only the upper or both stages. The first stage of the DBI 2000 has a stirring device that creates turbulence in the vessel. The special pump rotor serves with high circulation capacities, even for high viscosity products. The second stage of the dispersing machine DBI 2000 is equipped with a rotor-stator combination that ensures homogenous results and a narrow particle size distribution. Using vacuum additives are directly fed into this high turbulence dispersing area, which eliminates the disadvantages of conventional mixing processes.



### Patented design for challenging processes

The DBI 2000 can also be integrated in an existing system or process to replace older and inefficient inline machines. Our engineers would be pleased to advise on this possibility.



**Rotor-Stator System**  
The best in dispersing technology

### Patented pump and dispersion unit

This unique system combines high flow circulation, even particle size reduction and effective homogenization. Solid and liquid additives are fed directly into the dispersion chamber, which prevents lump formation and promotes rapid processing. During cleaning in place (CIP) the DBI pump stage supplies cleaning fluid in a high flow rate to the self-rotating spray nozzles and other system components.

- > Free selection pumping only or additional high shear dispersing
- > Direct feeding of solid and liquid additives
- > Effective dispersing with exchangeable tool designs
- > No additional pumps required for product circulation, CIP and discharge
- > The innovative design ensures shorter processing times and optimum dispersing quality



### The budget homogenizer

For more simple homogenizing and dispersing tasks the SPP can be also connected to a single stage unit type UTL 1000 as an alternative to the DBI.

# SPP | Technical data



**IKA+**  
**Small minimum volume**  
 Approx. 30 % of maximum capacity



Standard Production Plant	SPP 25	SPP 50	SPP 100	SPP 250	SPP 500	SPP 1000
<b>Technical data</b>						
<b>Mixing vessel</b>						
Min. useable volume [l]	8	15	30	75	150	300
Max. useable volume [l]	25	50	100	250	500	1,000
<b>Agitator</b>						
Type	RFG-01	RFG-02	RFG-03	RFG-04	RFG-05	RFG-06
Anchor Stirrer [rpm]	22 to 66	18 to 54	14 to 43	11 to 32	8 to 26	7 to 20
Drive Power [kW]	0.37	0.55	0.75	1.1	1.5	3
<b>Dispersing machine</b>						
Type	DBI 2000/4	DBI 2000/4	DBI 2000/5	DBI 2000/5	DBI 2000/10	DBI 2000/10
Drive Power [kW]	4	4	7.5	7.5	22	22
Alternatively:						
<b>Dispersing machine</b>						
Type	–	–	UTL 1000/10	UTL 1000/10	UTL 1000/10	UTL 1000/20
Drive Power [kW]	–	–	7.5	7.5	7.5	22
<b>Dimensions (agitator)</b>						
Height (closed cover) [mm]	1,350	1,450	1,750	2,000	2,800	3,100
Height (open cover) [mm]	1,500	1,650	2,000	2,500	3,200	3,800
Width (open cover) [mm]	1,070	1,340	1,370	1,820	2,080	2,935
Depth [mm]	800	950	1,080	1,150	1,350	1,770

SPP 2000	SPP 4000
600	1,200
2,000	4,000
RFG-07	RFG-08
6 to 17	4 to 13
4	7.5
DBI 2000/20	DBI 2000/20
45	45
UTL 1000/20	UTL 1000/20
22	22
3,750	4,260
4,625	–
3,500	2,600
2,200	2,600

DBI	DBI 2000/4	DBI 2000/5	DBI 2000/10	DBI 2000/20
<b>Technical data</b>				
<b>Recommended vessel size [l]</b>				
	10 – 50	50 – 250	250 – 1,000	1,000 – 5,000
<b>Motor power [kW]</b>				
	4	7.5	22	45
<b>Max. Total flow rate dispersing [l/h]</b>				
	2,000	5,000	20,000	45,000
<b>Max. total flow rate pumping [l/h]</b>				
	6,000	15,000	40,000	80,000
<b>Max. viscosity final product [mPas]</b>				
	100,000	100,000	100,000	100,000

Customization

IKA plants and accessories are adapted to your requirements

Optional dosing funnels

Various dosing funnels are available in different forms and sizes. They enable separate feeding of solid and liquid additives directly into the dispersing chamber for easy wetting of difficult ingredients. Due to its high flow rate the DBI 2000 creates a vacuum which sucks in the funnel content. For difficult conditions the function can be boosted with additional vacuum in the vessel. This advanced feeding method prevents floating of powders on the liquid surface and eliminates buildup on the vessel walls and agitator shaft.

Supply funnels as well as side vessels can be equipped with stirrers, in the event your additives require continuous agitation.



Formation of lumps is prevented by direct feeding of the additives into the dispersing chamber



① Buffer tanks available with or without agitator, double jacket and temperature control function for storage of your intermediate or final product

**IKA+**  
**Accessories**  
 The complete plant can also be supplied in Ex-protected execution acc. to the 94/9 EG (ATEX 95) guidelines.



② ③ Mobile or fixed side vessels for solids and liquids incorporation that can be delivered with different volumes.



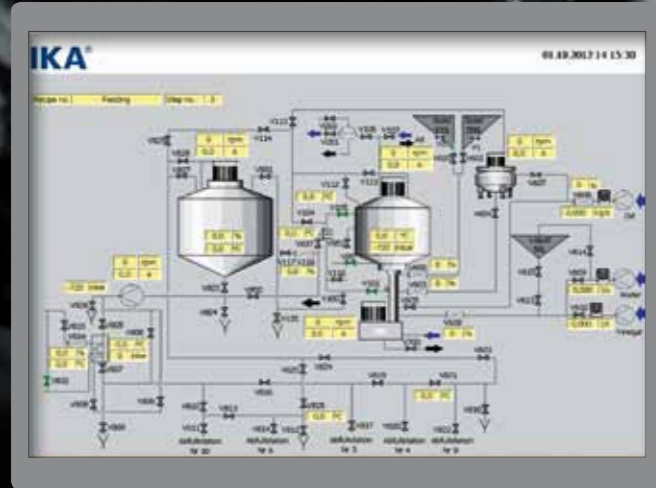
**IKA+**  
**Executed in IKA® quality**  
 > Consistently high product quality  
 > Direct steam injection into the circulation loop is available as an option



Direct steam injection



# SPP | Control system



Lifting	agitation not in position	VS relief				
DBI	RFG	RF	Vacuum system	Discharge	Drain	HS
0 rpm	0 rpm	700 rpm	60 mbar	0 rpm	0 s	37.8 °C
4000 rpm	0 rpm	700 rpm	-300 mbar	2000 rpm	0 s	30.1 °C
Circu pump	Discharge pump	DOS Liquid	DOS Subd-DBI	DOS Meistard	DOS Water	DOS Yeastar
0 rpm	0 rpm	0 %	0 %	0.0 kg	0.0 kg	0.0 kg
600 rpm	600 rpm	0 %	0 %	0.0 kg	145.5 kg	0.0 kg

Manual mode    Stop    Sequence manager

## Electronic control unit

The electronic control unit is designed to meet customer requirements. It can be a version with the simple on/ off button or another version, up to the most advanced PLC-Version with full visualization and touch screen. Manual operation or the full automatic program are the choices for operating the machine.

### Typical control functions are as follows:

- > Display of all set and actual values
- > Setting and monitoring of limit values
- > Recipe management system
- > Process data storage and display (trend indicator)
- > Safety interlocks

## Manage and save your recipes

The recipe management system uses a flow diagram, where the individual process stages can be selected as a sequence and parameter set step by step. Afterwards the complete process can be stored as a recipe and recalled for the next production.



## Electronic control unit

- > Fully automated, user-friendly operation
- > Stirrer and dispersion device with speed control



IKA DBI 2000

IKA DBI 3000

## Typical applications for the Standard Production Plant

This SPP mixing plant can be used for the production of solutions, emulsions and suspensions in many applications. Due to its advanced design it can handle products that range from low viscosity up to pasty condition.

Depending on its execution the IKA® Standard Production Plant can be e. g. used for the manufacturing of cosmetic cream and lotions, for mayonnaise or dressings in the food industry as well as for suspensions and emulsions in the chemical industry or for production of paints and lacquers.

Based on our long experience with many applications IKA® is your competent partner for processing plants. In order to select the best configuration for your specific application, our test facility is staffed with experienced application engineers. It is equipped with a wide range of laboratory and pilot equipment to qualify the appropriate equipment for applications.



### Pharmaceutical industries

- Lotions
- Paraffin emulsions
- Lipid emulsions
- Antiseptics
- Serums
- Vaccines
- Ointments
- Gels
- Eye drops**
- Eye ointments
- Cough mixtures
- Infusion solutions
- Sugar-/salt solutions
- Suppository masses
- Coatings

### Cosmetics

#### Creams

- Sun protection products
- Perfumes
- Shaving cream
- Decorative cosmetics
- Shampoo
- Body-care products
- Conditioners
- Hand washing paste
- Liquid soap
- Tooth paste
- Collagen suspensions
- Carbopol emulsions



### Beverages

#### Fruit juices

- Vegetable juices
- Milkshakes
- Protein drinks
- Liqueurs
- Sugar solutions
- Flavours



### Food

- Sauces
- Dressings
- Mayonnaise
- Ketchup**
- Liquid spices
- Spread cheese
- Ready-to-serve-meals
- Baby food
- Jams
- Pet food
- Starch solutions
- Alginate



### Chemical industry

- Cleaning agents
- Polishing agents**
- Sliding agents
- Lubricants
- Hotmelt adhesives
- Corrosion protection agents
- Wax emulsions**
- Ceramic suspensions
- Polymer emulsions
- Silicone emulsions
- TiO2 -suspensions
- Colloidal solutions
- Catalyst suspensions
- Impregnating agents
- Pesticides
- Fungicides



# Application example | Mayonnaise production

## Typical applications for the Standard Production Plant

Sauces to suit every taste – based on this concept, IKA® application engineers have developed a versatile processing system for the production of a range of different sauces, such as mayonnaise or ketchup. Mayonnaise is a popular condiment that consists of oil, water and egg yolk. Different countries have various recipe requirements for the designation of a product such as mayonnaise. In the EU member states, mayonnaise must have a total fat content of at least 70 % and an egg yolk content of at least 5 %. Under German delicatessen industry guidelines, salad mayonnaise must have an oil content of at least 50 %. Variations available on the market include mustard mayonnaise, tomato mayonnaise, as well as remoulades and various low calorie salad creams and dressings.

All such sauces are oil-in-water emulsions. An appropriate quantity of hydrophilic emulsifier must be added to prevent the phases from separating.

In the case of mayonnaise-type sauces egg yolk, milk protein or vegetarian emulsifiers are generally used for this purpose. The emulsion is stabilized and the viscosity of the final product is adjusted using hydrocolloids and starches. A properly balanced recipe produces the desired mouthfeel and optimum structure.

The incorporation of additives is not sufficient to produce a high quality emulsion. Most importantly, the oil phase must be broken down into very fine droplets - just one of the requirements the IKA® process is able to satisfy very rapidly. As the IKA® system can be used to prepare products with a wide viscosity range, it is ideal for manufacturing most types of sauces.

The SPP includes all components necessary for the preparation of excellent mayonnaise, ketchup and sauces.

Ingredients	Mayonnaise	Salad mayonnaise	Salad mayonnaise	Salad cream
Oil	80 %	67 %	50 %	35 %
Egg yolk	6 %	-	-	-
Sugar	2.6 %	2.6 %	2.6 %	2.6 %
Salt	1.3 %	1.3 %	1.3 %	1.3 %
Vinegar 10 %	3.5 %	3.5 %	3.5 %	3.5 %
Water	6.6 %	24.6 %	40.2 %	53.7 %
All-in-one stabilizer compound*	-	1.0 %	2.4 %	3.9 %

\* Compound comprising emulsifiers, hydrocolloids and optionally starches



1,000 liters of mayonnaise in just 10 minutes!



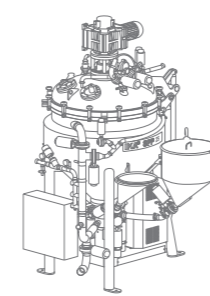
# Develop Optimize Scale-up

**IKA+**  
**Scale-up**  
Simplified scale-up by identical  
dispersing parameters for all  
sizes

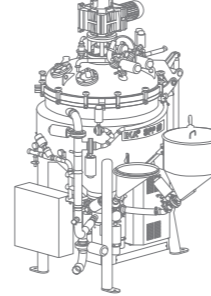
## Develop – Optimize – Scale-up from laboratory to production scale

When new products are developed the processes are initially tested in pilot plants. Trials in small scale are also used for changes in recipes or ingredients. For reliable scale-up to production sizes, pilot plants with a capacity of 25 l (SPP 25) or 50 l (SPP 50) are the ideal choice.

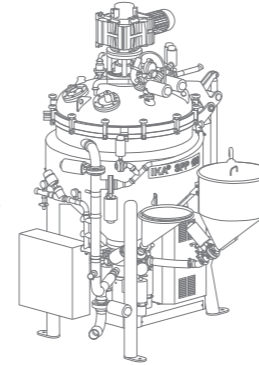
The use of the same plant design and dispersion principle ensures identical operation and provides an easy scale-up. Every size of the SPP produces the same constant product quality.



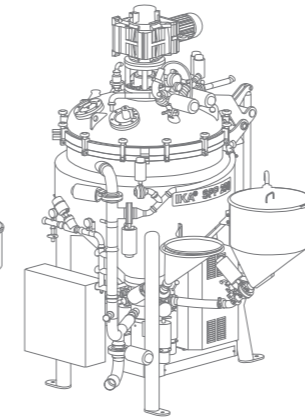
SPP 25



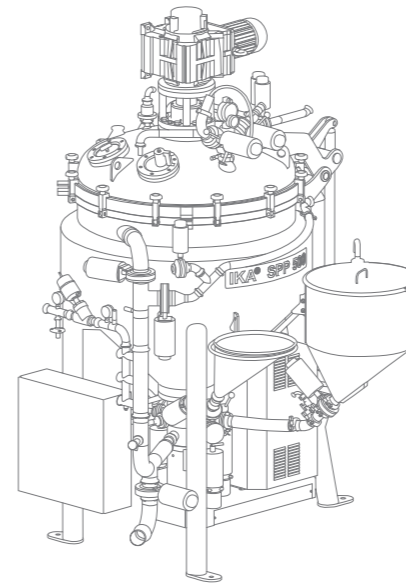
SPP 50



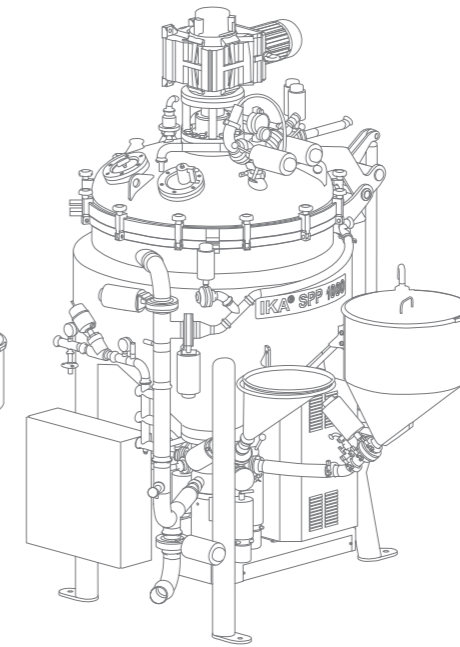
SPP 100



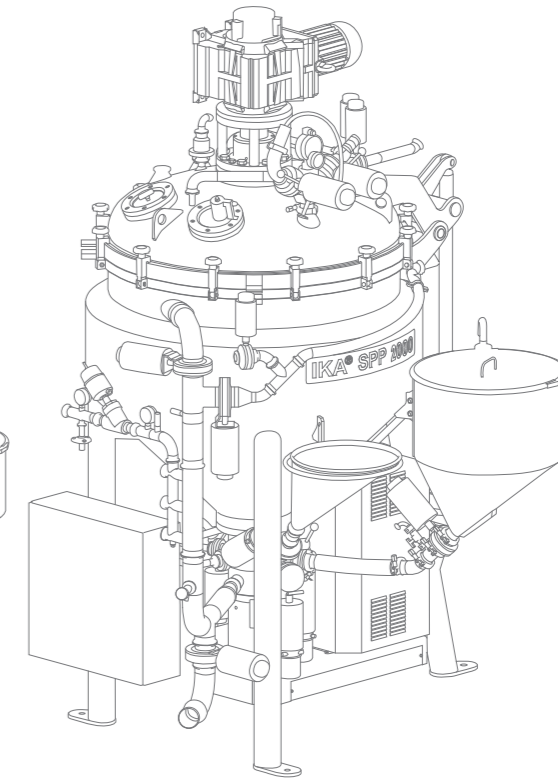
SPP 250



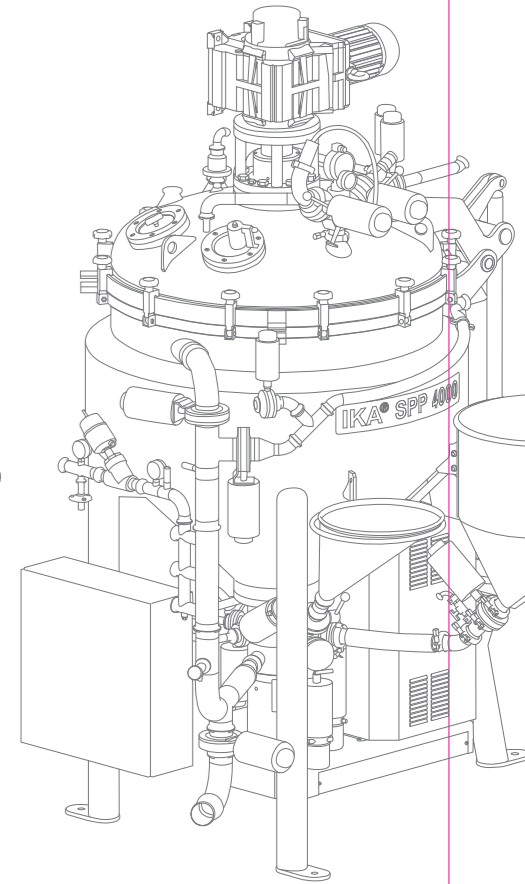
SPP 500



SPP 1000



SPP 2000



SPP 4000

## magic PLANT | Exceptional – Flexible – Unique

**IKA® introduces you to the next generation of laboratory scale process plants. The perfect simulation of the SPP system with smallest sample amounts.**

The magic PLANT is specifically designed to test process and product conditions in an accurate small-scale simulation. Once a satisfactory product is obtained at the pilot scale, the next step is to transfer the manufacturing process to the full-scale production. The magic PLANT system can be adapted to a wide range of applications and specific requirements especially in the food, cosmetic, chemical and pharmaceutical industries.

**magic PLANT | The most versatile laboratory reactor**

IKA® magic PLANT is the ideal laboratory scale process plant. This system is used for batch mixing, homogenizing, emulsifying and suspending for capacities of up to 2 liters. Independent from the product – the magic PLANT delivers a seamless process transition from product development to production.

**One machine | multiple applications**

The IKA® magic PLANT is an extremely versatile and multi-functional process plant. Depending on the application, this unit can easily be modified into three different configurations.

from laboratory to production



**IKA+**

### Advantages

- > Modular design with exchangeable tools
- > Speed control
- > Process simulation in smallest scale



### magic PLANT basic

- > Adjustable speed drive for perfect agitating of liquids or suspensions
- > Tiltable, double jacketed and insulated vessel
- > Exchangeable stirrer tools e. g. anchor and propeller type
- > Optional ULTRA-TURRAX® T 25 batch disperser

### magic PLANT inline

- > High shear inline disperser for high quality emulsions and suspensions
- > Pipe loop with manual 3-way valve for circulation or product discharge
- > Modular processing head for the simulation of various dispersing methods
- > Adjustable tip speed up to 40 m/s for smallest particle sizes

### magic PLANT powder

- > Efficient and gentle mixing for free flowing solids
- > Special powder agitator
- > Inclined working position for better mixing and drying results
- > Discharge by complete tilting of the vessel

- | Process Technology
- | Laboratory Technology
- | Analytical Technology

the three fields, in which IKA®-Group is combining tradition, innovation and highest technical quality. IKA® – a big name for high quality products and services for the global market.

# Process Technology



Laboratory Technology



UTC 115/KT >> T 25  
Dispersing



RT 115/KT >> S 50 N – W 80 SMK Jet mixer head  
Stirring



Pilot plants: magic PLANT >> LR 1000 control  
The connection between laboratory and the large-scale production.



IKA® offers more

### Vacuum Drying and Mixing



### Inline Dispensing

Inline powder wetting, wet milling and dispersing machines



### Process Plants

IKA® Master Plant with counter rotator for highest viscosities



### IKA® Laboratory & Analytical Technology

IKA® is indisputedly ranked in first place world-wide for laboratory technology. Numerous innovations prove the increasing dynamics of the company.

Magnetic stirrers, overhead stirrers, dispersers, shakers, mills, rotary evaporators, calorimeters and laboratory reactors make up the laboratory and analytical equipment's portfolio.

### Kneading

Vertical, horizontal and continuous kneading



### High Pressure Homogenizer

for applications, where it is necessary to reach particle sizes in a nano range





### Qualification

According to GMP guidelines, pharmaceutical companies are required to validate processes that influence product quality. The applied machines and plants are subjected to a severe qualification process. During this qualification it is tested and documented that the pre-specified functionality is achieved. As early as in the planning stages, IKA® machines and units are designed to be suitable for use in the pharmaceutical industry.

IKA® will provide the necessary documentation and, if desired, will conduct the design, installation and operation qualification together with you.



### Services | First-rate quality from initial consultation all the way to production

From the initial planning stages to final product realization, IKA® technology and services is with you each step of the way by offering a multitude of services:

- > Designing entire production plants
- > Performing test runs when developing new products
- > Planning and implementation of mechanical, electrical and pneumatic installations
- > Commissioning, including a test processing and training the operating personnel
- > Qualification

After project completion, our experienced engineers, electricians, chemists, application technicians and assemblers will be available to assist you with:

- > Technical advice for questions concerning operation, process, and maintenance of IKA® machines and plants
- > Spare parts service
- > Repair service
- > Modification and upgrading



### Pilot Plant | From idea to solution

IKA® pilot plant station consists of a vast array of different machines and plants as well as measuring and analytical devices. The pilot plant trials have influenced the concept and design of many of our machines and their tools.

Searching for a suitable machine for your application? At IKA® pilot plant station you can test out several mixing systems with a variety of tools. Our chemical engineers look forward to assisting and advising you during and after the trials. This way an optimal solution for your specific mixing task can be determined.



Subject to technical changes  
Indications not binding for delivery

**IKA®+**

**Learn more**

for further information on  
IKA® and IKA® products  
please visit our website

[www.ikaprocess.com](http://www.ikaprocess.com)

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